

REMARKS:

Claims 1-12 currently are pending. Claims 13-15 have been canceled as withdrawn from consideration for being directed to unelected species.

The Examiner has rejected claims 1, 3, and 9-12 under 35 U.S.C. 103(a) as being unpatentable over Heath et al. ('859). The Examiner believes that the use of a flexible thermoplastic elastomeric bonding agent as recited in present claim 1 is implied by the disclosure of Heath et al., essentially because Heath et al. state at column 1, line 56, that the bonding agent is "sympathetic to the components" used.

It should be noted that Heath et al. explicitly state only that the bonding agent is of the same material as the filter cloth (column 1, lines 57 to 58). The only material disclosed for the filter cloth is polypropylene, and consequently the only material disclosed for the bonding agent is polypropylene. Polypropylene is a thermoplastic (see column 1 line 62 to 63), which is rigid material and not a flexible or elastomeric material as recited in the instant claim.

Furthermore, at column 1, line 34, Heath et al. explicitly state that molded rubber, synthetic rubber, or plastic are examples only of the non-textile parts, i.e., the flanged tube. Realistically, it is virtually certain that the textile part, the filter cloth, will comprise a plastic material, typically polypropylene, which is in fact as disclosed in Heath et al.

The thermoplastic elastomers used as the present bonding agent have many desirable properties. Attached for the Examiner's convenience are four print-outs from the Internet describing the thermoplastic elastomers Hytrel (TM), Santoplene (TM), Pebax (TM), and Engage (TM), of which the first two are named as examples in the present application. Each of the print-outs originates from a different company, and each explains the properties of thermoplastic elastomers and describes the difference between thermoplastic elastomers and rubbers and thermoplastics.

The print-outs also place the use of the term "flexible" in context, as they state that thermoplastic elastomers have many desirable properties, for instance "... the flexibility of rubbers, the strength of plastics, and the processibility of thermoplastics" (see Hytrel print-out). On the other hand, the materials disclosed in Heath et al. are only thermoplastic, and, thus, when welded will become brittle.

The advantages of the thermoplastic elastomeric bonding agent are already described in the opening section of the present application, and especially in relation to the Heath et al. filter; see in this respect page 3 line 4 to page 4 line 10. Again, Heath et al. only disclose the case of an inflexible thermoplastic bonding agent, the bonding agent being selected such that it matches the filter cloth (column 1, line 56-60) so that induction heating causes fusion between the neck, cloth and bonding agent as they all have the same melting point. However, the cloth will be weakened when melted as such causes a significant loss in crystallinity at the boundary between the cloth that has melted and re-solidified cloth that has not melted. In short, wherever the filter cloth melts it becomes weakened. Furthermore, the thermoplastic is relatively brittle and hence the flange will crack if flexed too much.

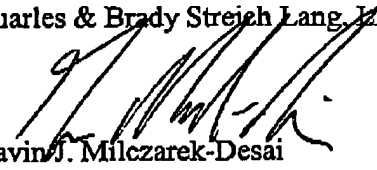
In the present invention, in contrast, a flexible piece of thermoplastic elastomeric bonding agent mixed with metallic powder is used. The present elastomeric bonding agent does not match the filter cloth substrate, and it has been found that a greater control is possible of the heat supplied for bonding since the elastomeric bonding agent/metallic powder mix enables a more uniform heat distribution enabling the bonding agent to flow into, and bond to, the surface of the filter cloth and barrel neck. This enables the bonding of a thermoplastic filter cloth to a thermoplastic elastomeric barrel neck with a strong bond. The strength is derived from the fact that it is only necessary to supply enough heat to melt the bonding agent and then fuse to the surfaces of the filter cloth and barrel neck. Hence, the original strength of the two components is not degraded, as they do not melt all the way through, and the finished article is strong enough to perform without failing.

In view of the foregoing, the disclosure of Health et al. cannot render the present invention obvious because nowhere does it teach or suggest "a filter element fixation apparatus comprising a flexible piece of thermoplastic elastomeric bonding agent" as claimed in the present application. Also, claim 6 has been amended to add missing language as indicated above to overcome the Examiner's objection. Moreover, claims 2 and 4-8 were indicated as allowable and only objected to as depending from the rejected base claim 1. Accordingly, the applicant respectfully requests that this case be advanced to allowance.

No fee is believed to be due with this amendment. Should there be any unforeseen costs, please charge our Deposit Account No. 170055.

Respectfully submitted,

Quarles & Brady Streich Lang, LLP



Gavin J. Milczarek-Desai
Reg. No. 45,801
520-770-8716 Phone
520-770-2235 Fax